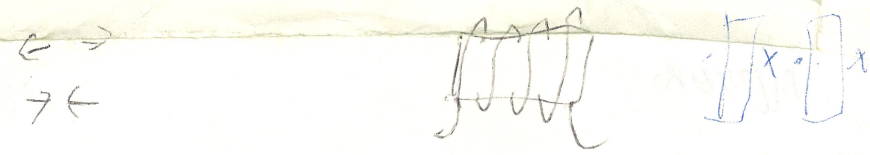
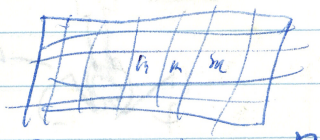
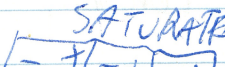


Scandanavia - metallurgy

MAGNET - little "domains" - magnets

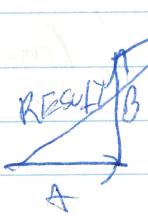


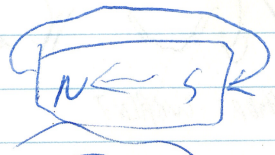


field shaped weird - different materials

$B = \frac{F}{il}$ Mag = $\frac{\text{force}}{\text{current} \times \text{length}}$

VECTOR →



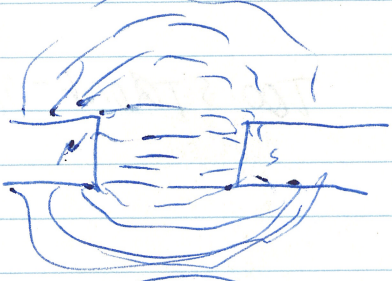


LAR

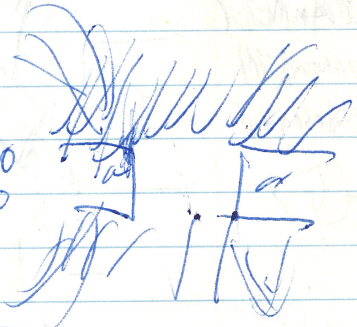
UNLIKE

$\Phi_{EARTH} = 10^{-4} W/m^2$

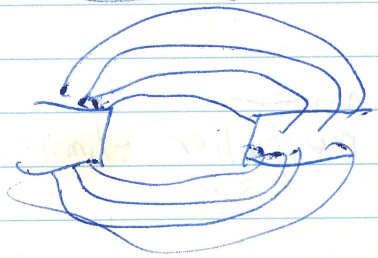
FARADAY

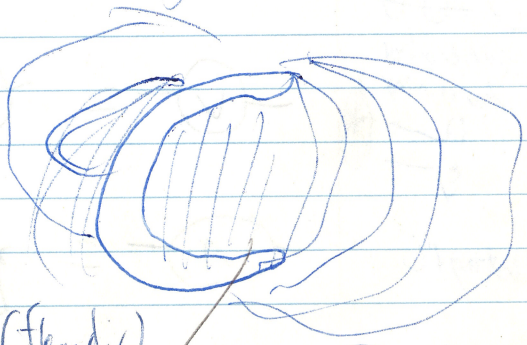


LIKE

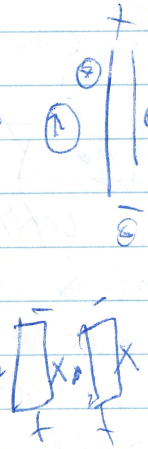


UNLIKE w/ MUTO





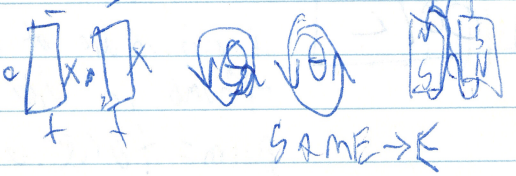
1st LH Straightwire



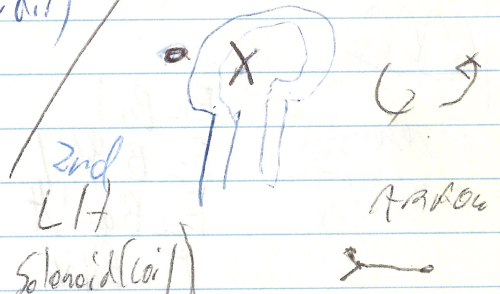
L-Hand rule Thumb to pos (flow dir)

N/am

$F = B i l$



2nd LH



Solenoid (coil)

fingers in dir of flow

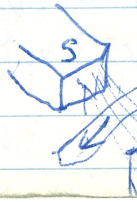
thumb N pole

RADIAL

no thumb S pole

3rd L-Hand for force dir given current + magnetic field

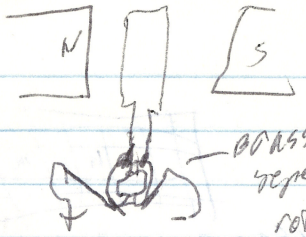
fingers in dir of mag field, thumb in electron flow direction



wire palm is dir of force on wire

MC magnetic core

MOTORS

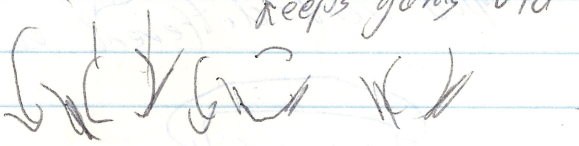


split rings & brushes

DC galvanometer
for AC heats up
WELDER SOLDERING GUN
or fuse

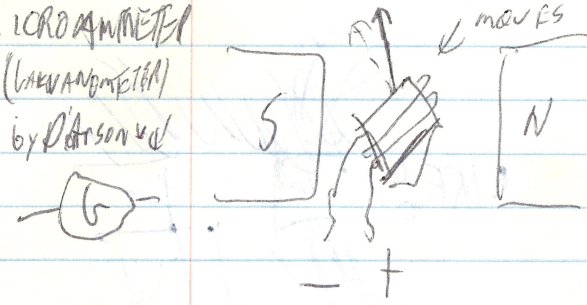
skip used in subways; sparks, wears out

keeps going via momentum



AC! (emulator)

MICROAMMETER (GALVANOMETER) by D'Arsonval

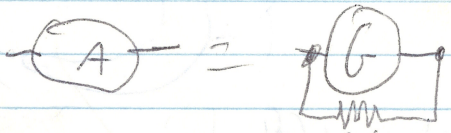


TOO STRONG - SPRING USED

$I = \text{coul/sec}$

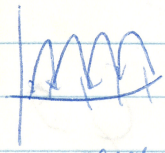
AC ~~AC~~ generator dual ring

PARALLEL!



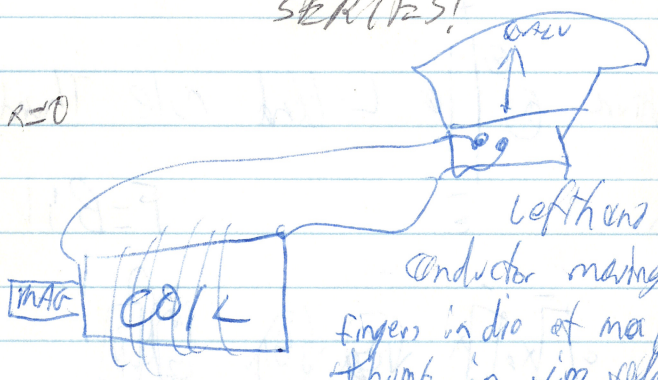
SERIES!

pulsating DC



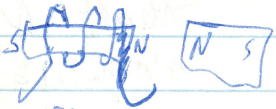
generator w/split ring

$F = BiL$
$F = B\frac{q}{t}\frac{L}{t}$
$F = Bqv$

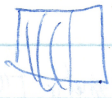


Left hand rule for conductor moving in a field!
fingers in dir of mag field
thumb in wire velocity direction
palm = force on electrons

LENZ'S LAW



mm3
use LH Rule 2 (other side)



Current goes thru coil, produces mag net which is opposite of mag used for elect.

SO ~~NO~~ YES OR NO!

CONSERVATION OF ENERGY

$(x-h)^2 = 4p(y-k)$

$x^2 - 2hx + h^2 = 4py - 4pk$

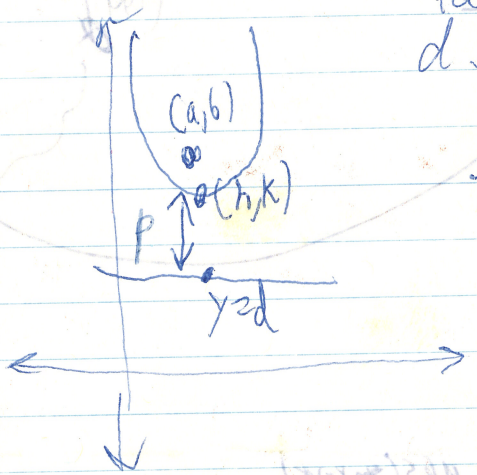
$2y(b-d) = x^2 - 2ax + a^2 + b^2 - d^2$

$\Rightarrow x^2 - 2hx + h^2 + 4pk = 4py$

p = dist dir (eqn)
vertex h, k
focus a, b
d = directrix y

$b^2 - d^2 = 4pk$

$2p = 6 - d$



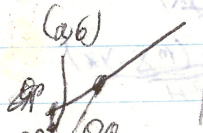
$(b+d)(b-d) = 4pk$

$(b+d)(b-d) = 2(b-d)k$

$b+d = 2k$

midpoint!

Calculus!!



Point to line

$oq\cos\theta = op$ $\quad abs\left(\frac{ax_0+by_0}{a^2+b^2}\right)$

$ax+by+c=0$

$x = x_1 + x'$ $\quad y = y_1 + y'$

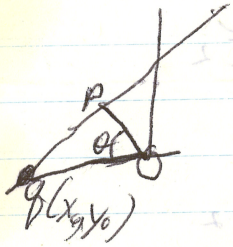
$a(x_1+x') + b(y_1+y') = c$

$O'(x_1, y_1)$

$ax_1 + by_1 = c$

$O'p = \frac{abs(ax_1+by_1+c)}{\sqrt{a^2+b^2}}$

$d = \frac{(x_1,y_1)}{ax+by+c}$



$mx - x + c = 0$

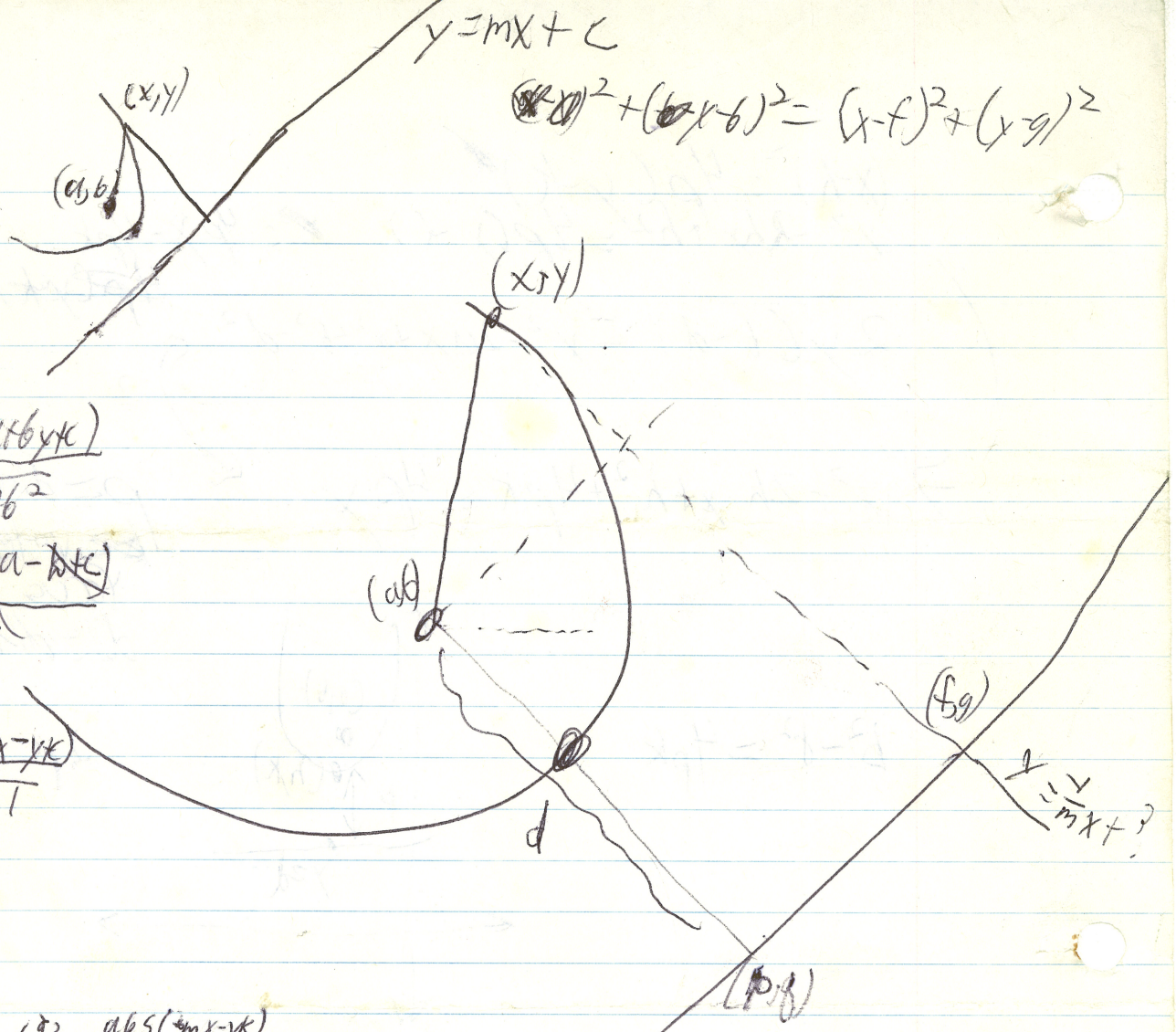
$oq = \sqrt{x_0^2 + y_0^2}$

$\cos\theta = abs\ \frac{(ax+by)}{\sqrt{a^2+b^2}\cdot\sqrt{x_0^2+y_0^2}}$

$op = oq\cos\theta$

$op = abs\ \frac{(ax+by)}{\sqrt{a^2+b^2}}$

$op = abs\ \frac{c}{\sqrt{a^2+b^2}}$



$(x-a)^2+(y-b)^2=(x-f)^2+(y-g)^2$

$d=\frac{abs(ax+by+c)}{\sqrt{a^2+b^2}}$

$d=\frac{abs(ma-b+c)}{\sqrt{m^2+1}}$

$d=\frac{abs(-mx-y+c)}{\sqrt{m^2+1}}$

Principle range θ 79°

$(x-a)^2+(y-b)^2=\frac{abs(-mx-y+c)}{\sqrt{m^2+1}}$

$x^2-2ax+a^2+y^2-2by+b^2=\frac{abs(mx-y+c)}{\sqrt{m^2+1}}$

$((x-a)+(y-b))^2=\frac{(mx-y+c)^2}{m^2+1}$

See other page!

$y=mx+c$

$mx+y+c=0$

$mx-y+c$

$mx-y+c$

$mxc-cy\ c^2$

$mxy+y^2-cy$

$m^2x^2-mxy+mxc$

$m^2x^2-2mxy+2mxc-2cy+c^2$

$\frac{g-y}{f-x}=\frac{1}{m}$

$mg-my=f-x$

$mg-my+x=f$